CLAIMS

What is claimed is:

1. A method of scaling image and video processing computational complexity in accordance with maximum available quantities of computational resource units, the method comprising the steps of:

(a) performing a plurality of data multiplications which processes digital image and video data, each data multiplication having a data dependent value multiplied by data independent value, the performance of each data multiplication requiring a predetermined quantity of computational resource units;

(b) selecting one of the data multiplications;

(c) selecting a shift-operation using the data independent value associated with the selected multiplication that requires a quantity of computational resource units which is less than the predetermined quantity of computational resource units required for performing the selected multiplication; and

(d) performing the selected multiplication with the selected shift-operation.

2. The method according to claim 1, wherein between the steps (b) and (c) further comprising the steps of:

acquiring the maximum available quantity of computational resource units for performing the selected multiplication;

determining whether the maximum quantity of computational resource units available for the selected multiplication is sufficient for performing same;

performing the selected multiplication if the maximum quantity of computational resource units available for the selected multiplication is sufficient for performing same; or

performing steps (c) and (d).

3. The method according to claim 1, wherein the data independent value is a single power of two and the selected shift-operation includes a single shift made according to the single power of two.

4. The method according to claim 1, wherein the data independent value is a sum of powers of two and the selected shift-operation includes at least one shift-operation corresponding to one of the powers of the sum.

5. The method according to claim 4, wherein the at least one shift-operation approximates the selected multiplication.

6. The method according to claim 4, wherein the selected shift-operation includes at least two shift-operations the results of which are added, the at least two shift-operations corresponding to two of the powers of the sum.

7. The method according to claim 4, wherein the power of the sum corresponding to the at least one shift-operation has a value which is nearest to the data independent value.

8. The method according to claim 1, wherein the data independent value is a difference of powers of two and the selected shift-operation includes at least one shift-operation corresponding to one of the powers of the difference.

9. The method according to claim 8, wherein the at least one shift-operation approximates the selected multiplication.

10. The method according to claim 8, wherein the power of the difference corresponding to the at least one shift-operation has a value which is nearest to the data independent value.

11. The method according to claim 8, wherein the selected shift-operation includes at least two shift-operations the results of which are subtracted, the at least two shift-operations corresponding to two of the powers of the difference.

12. The method according to claim 1, wherein the plurality of data multiplications defines an inverse discrete cosine transform.

13. The method according to claim 1, wherein the plurality of data multiplications form a multiple stage network having an input and an output, the selected multiplication is selected from a stage of the network which is nearest the output thereof.

14. The method according to claim 1, wherein the image and video processing includes image and video decoding and the digital image and video data is encoded digital image and video data.

15. A method of approximating an inverse discrete cosine transform to scale its decoding computational complexity in accordance with maximum available quantities of computational resource units, the transform decoding encoded digital image and video data by performing a plurality of data multiplications, each data multiplication having a data dependent value multiplied by data independent value, the performance of each data multiplication by the transform requiring a predetermined quantity of computational resource units, the method comprising the steps of:

(a) selecting one of the data multiplications;

(b) selecting a shift-operation using the data independent value associated with the selected multiplication that requires a quantity of computational resource units which is less than the predetermined quantity of computational resource units required for performing the selected multiplication; and

(c) performing the selected multiplication with the selected shift-operation.

16. The method according to claim 15, wherein between steps (a) and (b) further comprising the steps of:

acquiring the maximum available quantity of computational resource units for performing the selected multiplication;

determining whether the maximum quantity of computational resource units available for the selected multiplication is sufficient for performing same;

performing the selected multiplication if the maximum quantity of computational resource units available for the selected multiplication is sufficient for performing same; or

performing steps (b) and (c).

17. The method according to claim 15, wherein the data independent value is a single power of two and the shift-operation includes a single shift made according to the single power of two.

18. The method according to claim 15, wherein the data independent value is a sum of powers of two and the selected shift-operation includes at least one shift-operation corresponding to one of the powers of the sum.

19. The method according to claim 18, wherein the at least one shift-operation approximates the selected multiplication.

20. The method according to claim 18, wherein the power of the sum corresponding to the at least one shift-operation has a value which is nearest to the data independent value.

21. The method according to claim 18, wherein the selected shift-operation includes at least two shift-operations the results of which are added, the at least two shift-operations corresponding to two of the powers of the sum.

22. The method according to claim 15, wherein the data independent value is a difference of powers of two and the selected shift-operation includes at least one shift-operation corresponding to one of the powers of the difference.

23. The method according to claim 22, wherein the at least one shift-operation approximates the selected multiplication.

24. The method according to claim 22, wherein the power of the difference corresponding to the at least one shift-operation has a value which is nearest to the data independent value.

25. The method according to claim 22, wherein the selected shift-operation includes at least two shift-operations the results of which are subtracted, the at least two shift-operations corresponding to two of the powers of the difference.

26. The method according to claim 15, wherein the transform forms a multiple stage network having an input and an output, the selected multiplication is selected from a stage of the network which is nearest the output thereof.

27. A decoder which scales video and still image decoding computational complexity with available computational resources, the decoder comprising:

a variable length decoder;

an inverse quantizer which dequantizes signals received from the variable length decoder; and

an approximate inverse discrete cosine transform that scales decoding computational complexity in accordance with maximum available quantities of computational resource units.

28. The decoder according to claim 27, wherein the transform decodes encoded digital image and video data by performing a plurality of data multiplications, each data multiplication having a data dependent value multiplied by a data independent value, the performance of each data multiplication by the transform requiring a predetermined quantity of computational resource units, the transform performing at least one of the data multiplications with a shift-operation that requires a quantity of computational resource units which is less than is required for performing the at least one data multiplication.